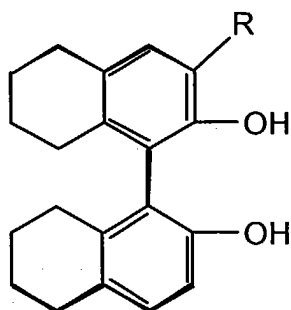


WHAT IS CLAIMED IS:

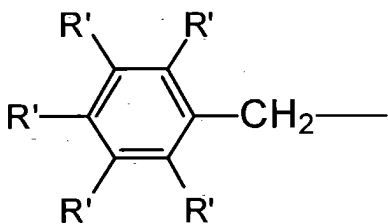
- 5 1. A compound of the formula



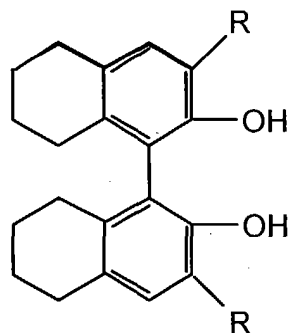
1

wherein:

- 10 R is C<sub>1</sub> to C<sub>20</sub> alkyl, C<sub>3</sub> to C<sub>20</sub> cycloalkyl, or benzyl of the formula



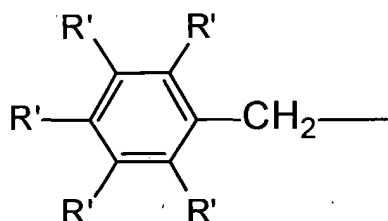
- 15 wherein each R' is independently H, alkyl or cycloalkyl of up to 6 carbons; and/or a compound of the formula



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wherein R is C<sub>1</sub> to C<sub>20</sub> alkyl other than methyl or t-butyl, C<sub>3</sub> to C<sub>20</sub> cycloalkyl, or benzyl of the formula

5



wherein each R' is independently H, alkyl or cycloalkyl of up to 6 carbons.

10

2. A process for making 3-alkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol and/or 3,3'-dialkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol, comprising contacting 5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol with at least one alkene or cycloalkene in the presence of an acid catalyst.

15

3. The process of claim 2 wherein the at least one alkene or cycloalkene is monoethylenically unsaturated and contains from 3 to 20 carbon atoms.

20

4. The process of claim 3 wherein at least one alkene or cycloalkene is selected from the group consisting of propylene, butene, pentene, hexene, cyclopentene, and cyclohexene.

25

5. The process of claim 2 wherein the acid catalyst is selected from the group consisting of aluminum chloride, trifluoromethanesulfonic acid, tosylic acid,  
5 phosphotungstic acid, silicotungstic acid, phosphomolybdic acid, zirconium triflate, aluminum triflate, polymeric perfluorinated sulfonic acid and polymeric sulfonic acid.
- 10 6. The process of claim 5 wherein the acid catalyst is aluminum chloride, phosphotungstic acid, or phosphomolybdic acid.
7. The process of claim 6 wherein the acid catalyst  
15 is phosphotungstic acid.
8. The process of claim 2 wherein the contacting is done in the presence of at least one solvent selected from the group consisting of nitromethane, methylene  
20 chloride, dichloroethane, chlorobenzene, dichlorobenzene, and nitrobenzene.
9. The process of claim 2 wherein the contacting is done at a temperature between 20°C and 220°C.  
25
10. The process of claim 9 wherein the temperature is between 90°C and 180°C and wherein the 5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol is contacted with a mono- or 1,2-disubstituted alkene.  
30
11. The process of claim 9 wherein the temperature is between 40°C and 90°C and wherein the 5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol is contacted with at least one alkene selected from the  
35 group consisting of 1,1-disubstituted alkene, tri-

substituted alkene, tetra-substituted alkene or aryl-substituted alkene.

5 12. A process for making 3-alkylated-  
5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol and/or  
3,3'-dialkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-  
binaphthol, comprising contacting 5,5',6,6',7,7',8,8'-  
octahydro-2,2'-binaphthol with a benzyl halide or  
10 tertiary alkyl halide, wherein the halide is bromide or  
chloride, in the presence of a Lewis acid catalyst.

13. The process of claim 12 wherein the Lewis acid  
catalyst is selected from the group consisting of  
15 aluminum chloride, zinc chloride, boron trichloride,  
SnCl<sub>4</sub>, SbCl<sub>5</sub>, and ZrCl<sub>4</sub>.

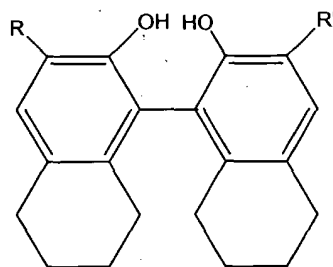
14. The process of claim 13 wherein the Lewis acid  
catalyst is zinc chloride.

20 15. A process for making 3-alkylated-  
5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol and/or  
3,3'-dialkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-  
binaphthol, comprising contacting 5,5',6,6',7,7',8,8'-  
25 octahydro-2,2'-binaphthol with an alkyl sulfonate,  
alkyl triflate, alkyl p-toluenesulfonate, or alkyl  
benzenesulfonate, in the presence of an acid catalyst  
selected from the group consisting of aluminum  
chloride, tosylic acid, phosphotungstic acid,  
30 silicotungstic acid, phosphomolybdic acid,  
trifluoromethanesulfonic acid and a rare earth metal  
triflate selected from the group consisting of scandium  
trifluoromethanesulfonate, ytterbium  
trifluoromethanesulfonate, and lanthanum  
35 trifluoromethanesulfonate.

16. The process of Claim 15 in which the alkyl sulfonate is of the formula  $A-SO_3-B$ , wherein A is  $C_1$  to  $C_8$  alkyl,  $C_1$  to  $C_8$  fluorinated alkyl,  $C_6$  to  $C_{10}$  aryl, or  $C_6$  to  $C_{10}$  fluorinated aryl; and B is  $C_1$  to  $C_{20}$  alkyl.

17. A process for making 3-alkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol and/or 3,3'-dialkylated-5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol, comprising contacting 5,5',6,6',7,7',8,8'-octahydro-2,2'-binaphthol with a benzyl, secondary or tertiary alcohol containing from 3 to 20 carbon atoms, in the presence of an acid catalyst selected from the group consisting of trifluoromethanesulfonic acid, sulfuric acid, HF, phosphoric acid, and aluminum chloride.

18. A compound of the formula



wherein:

R is H; and

25 R' is ethyl,  $C_3$  to  $C_6$  secondary, tertiary, or cyclic alkyl;

or a compound of the above formula wherein

R and R' are the same and are selected from the group consisting of

30 ethyl,  $C_3$  to  $C_6$  secondary or cyclic alkyl.

19. A compound of claim 18 wherein R and R' are the same are selected from the group consisting of ethyl, isopropyl, cyclopentyl, and cyclohexyl.

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